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much time in fixing it at each station, and in unfixing it again, and moving it from place to place, as this capstan would demand. The addition of the rollers to the mole plough seems an useful improvement, and there can be no doubt but that this plough by itself, independent of the capstan, drawn forward in the usual manner, would perform very well.

*Patent of Mr. Samuel Clegg, of Manchester, for a Rotative Steam Engine, Dated July, 1809.*

The piston of Mr. Clegg's Steam Engine, revolves horizontally in a hollow ring of cast iron, the vertical section of which is a semicircle; this piston is of the same shape as the ring, and is attached to a vertical axis in the centre by a flat bar, that lies between the upper plate of the engine, and the hollow ring. To prevent the steam from passing in the space about this connecting part, a number of upright pieces of metal, rounded a little at their bottoms, are placed all round in a smaller hollow ring, of a rectangular section, in contact and capable only of a verticle motion; the connecting part has a small roller in front, which passes under these upright pieces, and lifts them up in succession, and their own weight, assisted by springs at top, causes them to fall again into their first positions, as fast as the connector passes. Water is let in over them to keep the joints closer.

In the large hollow ring, a semicircular valve is placed on a hinge, which fits it exactly, and is capable of being moved up into a recess in the covering flat plate made to fit it. The steam is let in between this valve and the piston, which acquires momentum sufficient, before it comes round to it behind, to raise it up and pass beyond it; when it falls down again, and the action of the steam re-commences. The piston is represented of considerable bulk, with a view, it is supposed of encreasing the momentum so as to supply the action of a fly wheel. The power of the engine can be encreased by making a communication between a condenser, and the part of the large hollow ring at the opposite side of the valve from that at which the steam is admitted. The shaft or axis in the

centre gives motion to the pumps, steam valve, and all other requisite movements. The engine may be made to work by the pressure of a column of water introduced instead of steam.

The patentee states that he finds these engines answer in practice all the intended ends; that they cost only half the price of beam engines, take up little room, and make no noise; he mentions also that the space through which a piston of an engine of twenty horses power moves, will generally be about twenty feet.

*Remarks.* No account is given of any method of stuffing the piston, and it is apprehended this would not be easily affected, or readily kept tight from the shape of this part. The complication of the upright sliding poppets, to close the path of the connector, is also very objectionable; and however perfectly the engine might work at first, while these parts were new and nicely fitted, there can be little doubt but that from their constant motion they would be soon worn so much as to let much steam escape to a loss, and that, if the engine did not actually stop from this circumstance, its powers for the same expense of fuel would be considerably inferior to those of Watt's beam engines.

*On Electro Chemical Experiments, by Mr. G. J. Singer.*

*Phil. Jour.* v. 24, p. 174.

Mr. Singer has found, that the prevalent idea of a powerful Voltaic battery being necessary for the repetition of the new experiments, is mistaken, and that when the requisite precautions are observed, an apparatus of very moderate powers is sufficient.

The mode of employing the Voltaic battery at present in use, is by far the worst, when it is intended for experiments of decomposition; as this operation requires a continued action of a power of nearly uniform intensity, which but rarely occurs in the ordinary mode of charging.

Most experimenters estimate the acting power, and the best state of their apparatus by the length of wire which it will fuse. To obtain this object, a strong acid infusion is employed, when the battery is not of